origin of any former aortic branch of the homograft.

A 3 cm. sleeve of the homograft including the lesion was excised and a segment of thoracic artery was used to replace it. The patient tolerated the procedure well. He returned to his former employment and to an active life.

Upon histologic examination of the site of the tear in the homograft, the tissue was observed to be quite thin, consisting almost entirely of media in the area of the lesion. Disrupted medial tissue replaced by fibrin and undergoing organization was present at the margin of the defect. The other areas of the homograft were covered by a thin layer of adventitia.

DISCUSSION

The hemorrhage in this patient was due to a rupture in the wall of the lyophilized aortic homograft. Microscopic study showed that the adventitia, normally the most resistant layer of a vessel wall to rupture, was absent in the area surrounding the tear. Presumably the adventitia had been stripped from this segment during the preparation of the graft. The volume of hemorrhage was greater and more rapid in development than usually occurs with rupture of an abdominal aortic aneurysm because of the existing retroperitoneal cavity which had been recently surgically created.

The acute profound shock in this patient was similar to that observed in dogs subjected to hemorrhagic shock. In experiments on dogs it was noted that large doses of hydrocortisone, if administered intravenously within the first 30 minutes after blood pressure had decreased to 50 mm. of mercury, will uniformly return the blood pressure to 80 mm. or above and maintain it for extended periods.[1] How hydrocortisone does this is not known. There is evidence that normal circulating vasopressors will produce vasoconstriction only in the presence of adrenal cortical compounds. The amount of adrenal cortical compounds available and necessary during hemorrhagic shock may play a role in the apparent action of hydrocortisone in this situation.

It does seem apparent from reported cases such as the present one, and from animal experimentation, that hydrocortisone should be widely available for immediate intravenous administration to combat hemorrhagic shock and to maintain life until measures that take more time can be started. The initial intravenous dose should be 200 mg. If there is no response, up to 500 mg. of the drug may be given safely.

SUMMARY

Vascular collapse due to the rupture of an aortic homograft was successfully treated with hydrocortisone given intravenously. The administration of hydrocortisone was the initial procedure in a series of supportive measures. Hydrocortisone by vein may be life-saving in hemorrhagic shock.

36 South El Camino Real, San Mateo (Harris).

REFERENCES

1. Connolly, J. E., Bruns, D. L., and Stofer, R. C.: The use of intravenous hydrocortisone in hemorrhagic shock, Surgical Forum, IX:17, 1959.

2. Howland, W. S., Schweizer, O., Boyan, C. P., and Dotto, A. C.: Treatment of adrenal cortical insufficiency during surgical procedures, J.A.M.A., 160:1271, 1956.

3. Rukes, J. M., Orr, R. H., and Forsham, P. H.: Clinical uses of intravenous hydrocortisone, Metabolism, 3:481, 1954.

4. Rukes, J. M., Orr, R. H., Forsham, P. H., and Galante, M.: The use of intravenous hydrocortisone in major surgery, Ann. N. Y. Acad. of Sci., 61:448, 1955.

Anaphylactoid Reaction to Oral Penicillin

LOIS PENDLETON TODD, M.D., Palo Alto

ANAPHYLACTOID REACTION is a severe, shock-like systemic disturbance occurring within thirty minutes after a substance to which a person is hypersensitive enters his body. Among the wide variety of pharmacological and biological substances that can act as antigenic agents is penicillin in any of the many forms in which it is prepared.

The first case of anaphylactoid shock from penicillin administered intramuscularly was reported in 1945.[4] Since that time the widespread use of penicillin has resulted in an increasing number of well documented instances of severe anaphylactoid reaction to this antibiotic. Even penicillin taken by mouth may cause severe[7,10] or fatal[13] anaphylaxis. Since 1953 when the first report of anaphylactoid reaction to ingested penicillin was published,[16] 28 cases have been reported in the English literature.* These were recently reviewed by Batson.[1]

This hazard associated with the use of this usually innocuous drug emphasizes that it ought not be administered without valid reason for its use on sound medical principles. Even when there is no past record of an allergic reaction to penicillin, the occasional serious consequences of using this drug fully justify requiring clear medical indications of penicillin-sensitive bacterial infection before it is prescribed. The present report of anaphylaxis following ingestion of penicillin by a young woman without previously known penicillin sensitivity emphasizes these principles.

CASE REPORT

On November 16, 1959, a 20-year-old woman student came to the Stanford University Student Health Service with complaint of a sore throat. Oral temperature was 97° F., and the pulse rate 72. Beginning coryza and minimal pharyngitis were noted. One slightly enlarged lymph node was palpated at the apex of each anterior cervical triangle. A long-

Submitted June 13, 1960.

*References 1-3, 5-15, 17.

acting antihistamine and a throat lozenge (containing bacitracin and tyrothricin) were prescribed.

The following morning, thinking she was unimproved, the patient consulted an otolaryngologist, who found essentially the same physical changes. She was given Pen-Vee® tablets (each containing 300 mg. of penicillin) with instructions to take one three times a day. She took the first tablet at 12:05 p.m., then went to the dining room for lunch, which is served at 12:15. Before sitting down to the table she felt prickling, burning sensations all over her body and became so flushed that her roommate exclaimed that she looked as "red as a beet." By that time she felt very ill and returned to her room, some sixty feet away, where instantly she collapsed on the bed.

The residence unit counselor called the Student Health Service at 12:25. By the time I reached her, some five minutes later, and twenty minutes after she had taken the penicillin tablet, her skin was dark red and her eyelids and lips decidedly swollen. She appeared weak and frightened. No radial pulse could be felt. The pupils were dilated, the conjunctivae suffused, the nail beds cyanotic and respirations rapid and shallow. When questioning elicited that the patient had taken penicillin, 0.8 ml. of 1:1000 aqueous solution of epinephrine was promptly given intramuscularly, followed 3 minutes later by hydrocortisone (50 mg. of Solu-Cortef® in solution) and then by 0.5 cc. of 1 per cent solution of metaraminol bitartrate (Aramine® bitartrate) both given intramuscularly. At this time the heart rate, counted by stethoscope, was 160 and the beat was light. The radial pulse could not be counted. The cyanosis appeared to be due to laryngeal edema and vasomotor collapse. There were no rales noted in the chest. As no sphygmomanometer was at hand, the blood pressure was not determined. Within fifteen minutes after metaraminol bitartrate was given, the skin began to become a lighter red and the breathing improved in quality. Gradually the swelling of the eyelids and lips subsided and the suffusion of the conjunctivae cleared. Gradually the heart rate slowed to 88 and the beat became more forceful. A few minutes later a very strong, shot-like radial pulse at a rate of 68 a minute was felt.

A half hour later the color of the skin was normal. The patient relaxed and went to sleep for a few minutes. During the reaction she did not appear to have lost consciousness. At 3 p.m. 4 mg. of triamcinolone was given by mouth. Two hours later the patient said she felt fine. Nevertheless, she was taken to the infirmary for observation. There she ate a hearty dinner. Another 4 mg. tablet of triamcinolone was given at 7 p.m., and at 10:30 p.m. 8 mg. was given. The next morning the patient returned to her dormitory and to her classes. Her cold was gone.

She continued to take triamcinolone, one 4 mg. tablet every six hours for one day, three tablets the next day, two tablets the next, and then one tablet for a day. The patient recovered completely. At no time was there pruritus or urticaria.

It was learned that the patient had received penicillin intramuscularly four times previously between 1948 and 1957. She had never had any manifestation of any allergic diathesis, but a brother was hypersensitive to house dust.

In light of the alarming developments in the present case, and in others reported in the literature, it would seem good routine to observe a patient for 20 minutes after administration of penicillin by any route.

SUMMARY

A healthy young woman who had shown no previous sensitivity to penicillin had severe anaphylactoid reaction to a 300 mg. tablet of penicillin (Pen-Vee®) taken orally.

1445 Hamilton Avenue, Palo Alto.

REFERENCES

1. Batson, J. M.: Anaphylactoid reactions to oral administration of penicillin, N.E.J.M., 262:590-594, 1960.

2. Bell, R. C.: Anaphylactic shock due to oral penicillin, Lancet, 2:439-441, 1956.

3. Birk, R. E., and Quinn, E. L.: Anaphylactoid reaction to oral penicillin G; case report, Henry Ford Hosp. M. Bull., 5:183, 1957.

4. Cormie, F. E., Jacobsen, L. Y., and Smith, E. L.: Bull. U. S. Army M. Dept., 4:694-702, 1945.

5. Eisenstadter, D., and Hussar, A. E.: Severe anaphylactic reaction from oral penicillin, Am. Practitioner & Digest. Treat., 5:783, 1954.

6. Fraser, H.: Immediate anaphylactic shock from oral penicillin, M. J. Australia, 2:801, 1958.

7. Gullatt, R.: Brief recording: Anaphylactic shock from penicillin lozenge, N.E.J.M., 257:1037, 1957.

8. Krohn, S. E.: Anaphylactic shock from oral penicillin, N. Y. State J. Med., 56:1789-1793, 1956.

9. Lang, L. P., and Clagett, A. H., Jr.: Anaphylactic reaction following oral administration of penicillin, N.E.J.M., 253:652, 1955.

10. Madalin, H. E.: Anaphylactoid reaction following use of penicillin lozenge, J. Michigan M. Soc., 53:61 and 91, 1954.

11. Maganzini, H. C.: Anaphylactoid reaction to Penicillins V and G administered orally; report of two cases and brief review of subject, N.E.J.M., 256:52-56, 1957.

12. Martin, F. J.: Anaphylactoid reaction to oral penicillin; report of case, Ann. Int. Med., 49:662-665, 1958.

13. Mason, L. H.: Case of fatal shock following oral penicillin, Canad. Med. Assn. J., 76:958, 1957.

14. Miller, P. B.: U. S. Armed Forces Med. J., 16:451, April 1960.

15. Peters, G. A., Henderson, L. L., and Prickman, L. E.: Anaphylactic penicillin reactions; three nonfatal cases of reaction to oral penicillin with positive skin tests and one fatal case following intramuscular penicillin, Proc. Staff Meet., Mayo Clin., 30:634-640, 1955.

16. Pierce, H. E., Jr.: Anaphylactoid reaction due to oral penicillin; case report, J. Nat. M. A., 45:68, 1953.

17. Weiner, R. G., Necheles, J. R., and Stanka, H.: Anaphylaxis following oral administration of penicillin, Am. Practitioner & Digest. Treat., 7:377-380, 1956.